

# DATA DISTRIBUTING SYSTEM AND DATA RECORDING METHOD

This application is based on application Nos. 11-89721 and 11-89722 filed in Japan, the content of which is hereby incorporated by  
5 reference.

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

10 The present invention relates to a data distributing system and a data recording method, and more specifically to a data distributing system to distribute desired book data to users by recording the book data into users' data storage media such as optical disks and a data recording method adopted in the data distributing system.

### 15 2. Description of Related Art

In recent years, a system to distribute book data widely by recording the book data in rewritable storage media such as optical disks and to reproduce the data by use of portable electronic book players or personal computers is suggested. In this specification, the book data  
20 mean information which is conventionally distributed as printed matter such as books, weekly and monthly magazines, technical books, newspapers, advertisements, etc.

In order to realize the data distributing system, it is necessary that users can store desirable book data in their storage media at places  
25 where they can stop by easily, such as convenience stores and stands at stations, etc.

In another aspect of this system, when users buy book data, they cannot see the content directly as they can in buying paper books, and there is fear that users may buy different book data from what they have wanted. Accordingly, when a user wants to return book data for this  
5 reason or to delete book data from a storage medium because of short of capacity of the storage medium, it is necessary to comply with such a demand.

## SUMMARY OF THE INVENTION

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An object of the present invention is to provide a data distributing system wherein users can store desired data in storage media easily and a data recording method adopted in the system.

Another object of the present invention is to provide a data  
15 distributing system wherein users can store desired data in storage media easily and also can delete the recorded data from the storage media and a data recording method adopted in the system.

In order to attain the objects, a data distributing system according to the present invention comprises: a storage section which is stored with  
20 a plurality of pieces of data; a receiving section which receives a storage medium; a reading section which reads at least part of data stored in the storage medium which is set in the receiving section; a selecting section which selects a specified piece of data from the data stored in the storage section in accordance with the data read out by the reading section; and a  
25 recording section which records the selected data into the storage medium.

The receiving section, the reading section, the selecting section and the recording section are integrated into one unit, and such units are installed in a plurality of places. These units are connected to the storage section by communication means including a telephone line and a  
5 communication satellite.

What the reading section reads out from the storage medium are, for example, data for specifying a book, and what the selecting section selects are, for example, data for a subsequent number or volume of the book specified by the data read out by the reading section.

10 In the data distributing system, the storage medium may be brought by the user or may be provided to the user at the site. If the storage medium is stored with data for specifying a book which may be desired by the user, the data are read out by the reading section. Then, based on the read data, a piece of data is selected from the data stored in  
15 the storage section, and the selected data are recorded into the storage medium.

It is preferred that such distributing units incorporating the receiving section, the reading section, the selecting section and the recording section are installed in many places. Because the volume of  
20 data to be stored in the storage section is enormous and because writing of data into the storage section is to be performed very often, the storage section shall be of a large capacity, and a method wherein the storage section transmits data to the distributing units shall be adopted. If a limitation is set to the data to be distributed to the users, the data may be  
25 stored in the distributing units. Also, popular data may be stored in the distributing units.

According to the present invention, users can obtain desirable data by performing an easy process of setting a storage medium in the receiving section.

Another data distributing system according to the present invention comprises: a storage section which is stored with a plurality of pieces of book data; a display section which displays index information about the book data stored in the storage section; a selecting section which selects a piece of index information from the index information displayed on the display section; a receiving section which receives a storage medium; and a recording section which records book data specified by the index information selected by the selecting section into the storage medium.

In this data distributing system, the user can get index information about the book data stored in the storage section from the display section. Further, when the user selects a piece of index information, book data specified by the selected index information are stored in the storage medium.

Further, another data distributing system according to the present invention comprises: a storage section which is stored with a plurality of pieces of data; a receiving section which receives a storage medium; a selecting section which selects a specified piece of data from the data stored in the storage section; a recording section which records the specified data into the storage medium; an accounting section which cast accounts for the data recorded into the storage medium; a reading section which reads out at least part of the specified data recorded into the storage medium; a deleting section which deletes the specified data

from the storage medium; and an account adjusting section which adjusts the accounts cast by the accounting section in accordance with the data deletion performed by the deleting section.

By use of this data distributing system, users can obtain desirable data only by performing an easy process of setting a storage medium in the receiving section. On the other hand, when the user desires deletion of data which have been once recorded into the storage medium, the data can be deleted by the deleting section.

Such data deletion is performed in two kinds of cases. One is a case of returning data which have been purchased by mistake, and this is refundable. In such a case, in this data distributing system, the date and time when the data were recorded to the storage medium are read out, and it is judged whether or not a specified time has passed since the recording date and time. If the specified time has passed, the return of data is not accepted, and the data deletion is not admitted. The other is a case of merely deleting data because of shortage of capacity of the storage medium or the like. In such a case, the account adjusting section does not operate, and data deletion is executed on no conditions.

In this data distributing system, users can store desirable data in storage media and can delete undesirable data from storage media. This system eliminates the users' trouble of having to buy data deleting devices by themselves and of throwing away storage media stored with unnecessary data. This data distributing system can be used easily, which may results in wide spread of this system.

## BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects and features of the present invention will be apparent from the following description with reference to the  
5 accompanying drawings, in which:

Fig. 1 is a general structural view of a data distributing system according to the present invention;

Fig. 2 is a front view of an electronic book vending machine incorporated in the system;

10 Fig. 3 is a block diagram which shows a control circuit of the electronic book vending machine;

Fig. 4 is a flowchart which shows a control procedure (main routine) of the control circuit;

Fig. 5 is a flowchart which shows an operation subroutine;

15 Figs. 6 through 8 are flowcharts which shows a subroutine for a display and a sale of an electronic book;

Fig. 9 is a flowchart which shows a subroutine of using stored data for a book search;

20 Fig. 10 is a flowchart which shows another subroutine of using stored data for a book search;

Fig. 11 is a flowchart which shows a subroutine for a key-word search;

Fig. 12 is a flowchart which shows a subroutine for data cancellation/deletion; and

25 Figs. 13a through 13m are illustrations which show various ways of displaying information on a display device of the electronic book

vending machine.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

5 Preferred embodiments of a data distributing system and a data recording method according to the present invention are described with reference to the drawings.

### General Structure of Data Distributing System

Fig. 1 shows a general structure of a data distributing system  
10 according to the present invention. This system is generally composed of one electronic book data storage center 1 and a plurality of electronic book vending machines 2. There is provided one storage center 1 in the country or in every main region, and in the storage center 1, all kinds of electronic book data are stored. There are provided one or more vending  
15 machines 2 at each of many places where users can easily stop by (convenience stores, stands at stations, etc.). The storage center 1 is connected to the vending machines 2 by telephone lines 3 or via a communication satellite 4 so as to exchange data with the vending machines 2. Between the storage center 1 and the vending machines 2,  
20 three communication routes are possible as indicated by arrows "a", "b" and "c" in Fig. 1.

Each vending machine 2, in compliance with a user's (buyer of book data) request, reads electronic book data from the storage center 1 and records the data in a storage medium 6, which can be used in an  
25 electronic book player 5 so that the data can be reproduced by the player 5.

The storage medium 6 incorporates a storage element which is capable of recording, reading and deleting data, such as an optical storage element, a photomagnetic storage element, a magnetic storage element, a non-volatile semiconductor storage element or the like. The electronic book player 5 has screens 5a and 5b made of liquid crystal or the like. The storage medium 6 is attachable to and detachable from the player 5, and the player 5 is capable of reproducing book data stored in the storage medium 6 on the screens 5a and 5b.

#### Structure of Vending Machine

Fig. 2 is a front view of the electronic book vending machine 2. On the front side, a display device 21, an operation device 22, a cash receiver 23, a credit card receiver 24, a storage medium receiver 25, a change ejecting device 26, a purchased storage medium ejecting device 27, etc. are provided. The operation device 22 incorporates a keyboard for inputs of letters and buttons for selection. Otherwise, the display device 21 may be so designed to display touch switches which serve as an operation panel.

#### Control Circuit

Fig. 3 shows a control circuit of the electronic book vending machine 2. The main member of this circuit is a CPU 31 and comprises the operation device 22, a data storage device 33, the display device 21, a reading/reproducing device 34 which reads data from the storage medium 6 and reproduces the data, a recording/deleting device 35 which records or delete data to or from the data storage medium 6, the purchased storage medium ejecting device 27, etc. The cash receiver 23, the credit card receiver 24 and the change ejecting device 26 are connected to the CPU 31



via an accounting device 36. The data storage device 33 is temporarily stored with book data which have been sent from the storage center 1 and received by the data sending/receiving section 32. The purchased storage medium ejecting device 27 has a stock of new storage media  
5 which have been initialized but have not been stored with any book data, and in accordance with the user's operation, ejects such a new storage medium.

### Control Procedure

Next, a way of using the electronic vending machine 2 is described  
10 following a control procedure carried out by the CPU 31.

### Initialization

Fig. 4 shows a main routine of the CPU 31. When the CPU 31 is reset, all the members are initialized at step S1. At step S2, information to be displayed on the display device 21 in a stand-by state is read out.  
15 This information is, for example, an advertisement of a certain book which has been set by the store where the vending machine 2 is installed or has been sent from the storage center 1. At step S3, the information is displayed on the display device 21.

### Operation

Fig. 5 shows a control procedure of the operation device 22 when a user operates the device 21. First at step S11, it is judged whether or not a new medium button has been pressed. When the button has been pressed, which means when the user wants a new storage medium, a sale of a new medium is performed at step S12. The detailed description of  
25 this process is omitted.

When a storage medium is inserted in the storage medium

receiver 25 ("YES" at step S13), it is judged at step S14 whether or not cancellation/return or deletion of book data from the storage medium is desired. If cancellation or deletion of data is desired, data cancellation/deletion is performed at step S15. If cancellation/deletion is not desired, a sale of book data is performed at step S16.

If any storage medium is not inserted ("NO" at step S13), it is judged that the user wants to search for a book to buy, and it is judged at step S17 whether or not the user wants to make a key-word search. If "YES", a key-word search is performed at step S18. If "NO" at step S17, categorized book lists are displayed at step S19 so that the user can select a desirable book.

In the following, control procedures at steps S15, S16, S18 and S19 are described.

#### Display of Book Lists

Figs. 6, 7 and 8 show a subroutine for a sale of book data performed at step S16 and for a display of book lists performed at step S19. First, a process of displaying categorized book lists is described. In accordance with the user's operation with a selection button, a book list of a selected category is displayed on the display device 21. If the store which owns the vending machine 2 sets a prior book category ("YES" at step S21), a book list of the category is displayed at step S22. Further, a list of books which come into sale today may be displayed in a stand-by state (see Fig. 13a).

If the store does not set a prior book category, general (primary) categories of books, namely, magazines, technical books, stories, practical books, etc. are listed on the display device 21 at step S23 (see Fig. 13b).

When the user selects one of these primary categories, specific (secondary) categories of the primarily selected group are listed. For example, if "magazines" is selected as the primary category, secondary categories such as science, sports, cars, etc. are listed. If "practical  
5 books" is selected, secondary categories such as pleasure, business, languages, etc. are listed (see Fig. 13c).

Then, when the user selects one of these secondary categories, more specific (third) categories of the secondarily selected group are listed. For example, if "sports" is selected as the secondary category, third  
10 categories such as baseball, soccer, ski, etc. are listed (see Fig. 13d). If "pleasure" is selected, third categories such as fishing, pets, pictures, etc. are listed. Then, when the user selects one of these third categories, the titles of books in the selected group are displayed (see Fig. 13e).

If the store which owns the vending machine 2 especially wants to  
15 sell books of a certain group, the display device 21 may be so controlled to display the third categories of the group in a stand-by state.

#### Recording of Book Data

When it is judged at step S24 that the user has selected a book, the title of the selected book is displayed at step S25, and it is judged at  
20 step S26 whether or not a storage medium is in the receiver 25. If there are no storage media in the receiver 25, a message to instruct the user to insert a storage medium in the receiver 25 is displayed at step S27 (see Fig. 13f), and the program waits until cancellation is requested at step S28 or until a storage medium is inserted in the receiver 25.

25 When a storage medium is inserted in the receiver ("YES" at step S26), an inquiry to ask the user whether or not the user intends to store

the book data in the storage medium is displayed at step S41. After the user's intention of storing the book data in the storage medium is confirmed at step S42, settlement of the account (insert of cash or use of a credit card) is confirmed at step S43. If the account has not been settled,  
5 a message to request settlement of the account is displayed at step S44, and the program waits until cancellation is requested at step S45 or until the account has been settled. When the settlement of the account is confirmed ("YES" at step S43), at step S46, the book data and also the date and time are stored in the storage medium.

#### 10 Recording of Request Data for the Subsequent Numbers or Volumes

If there is a sales plan of the subsequent numbers or volumes of the book of which data have been recorded at step S46 ("YES" at step S47), an inquiry to ask the user whether or not the user wants data to be used to request the subsequent numbers or volumes is displayed at step S48.

15 If the user's desire for the data is confirmed, the data is stored in the storage medium at step S49. If the user wants subscription, such request data may be automatically stored in the storage medium.

#### Reproduction of Recorded Data

On completion of recording of the book data into the storage  
20 medium in the above-described way, at step S50, the recorded book data are reproduced on the display device 21 so that the user can recognize the content. When the user inputs his/her OK at step S51, the storage medium is ejected from the vending machine 2 at step S52. On the other hand, if the user wants cancellation ("YES" at step S53), the recorded  
25 book data are erased from the storage medium at step S54. Then, the account is adjusted at step S55, and the storage medium is ejected at step

S52.

### Automatic Selection of Book

When a storage medium is inserted in the vending machine 2, the reading/reproducing device 34 at step S31 works to read the data from the storage medium and judges at step S32 whether or not there are any data in the storage medium. If there are data in the storage medium, it is confirmed at step S33 whether or not there are request data for the subsequent numbers or volumes. If "YES" at step S33, from the books of which data are in the storage medium and of which subsequent number/volume request data are in the storage medium, ones of which subsequent numbers and volumes are in sale are displayed at step S34 (see Fig. 13g). Thereafter, the processes at step S41 and the subsequent steps are performed to store desired book data in the storage medium.

It is possible to use a storage medium exclusively for a specified book. Specifically, subsequent number/volume request data of a specified book are stored in a storage medium beforehand, and thereby, when the storage medium is inserted in the vending machine 2, the reading/reproducing device 34 reads the request data, which results in automatic selection of the subsequent numbers or volumes of the book. This method allows users to subscribe weekly or monthly magazines in an easy way.

### Way of Searching Books Related to Data in Storage Medium

Even if there are no subsequent number/volume request data ("NO" at step S33) in the storage medium, books related to the book data stored in the storage medium are searched automatically at step S35.

Fig. 9 shows a subroutine for a book search by use of the stored

data. At step S56, any revisions of the books of which data are in the storage medium are searched. If it is confirmed at step S57 that there are any revisions of the books, a list of these revisions is displayed on the display device 21 at step S58 (see Fig. 13h). If the user  
5 selects/determines to buy one of these revisions at step S59, the title of the selected one is displayed at step S60, and the processes at step S46 and the subsequent steps are performed.

If there are no revisions ("NO" at step S57), any subsequent numbers or volumes of the books are searched at step S61. If it is judged  
10 at step S62 that there are subsequent numbers or volumes of the books, a list thereof is displayed on the display device 21 at step S63. Also, when the user does not want to buy any of the revisions ("NO" at step S59), the program goes to step S61. Next, if the user selects/determines to buy one of these numbers and volumes, the title of the selected one is displayed at  
15 step S65. Then, the processes at step S49 and the subsequent steps are performed.

When there are no subsequent numbers or volumes ("NO" at step S62) or when the user does not want to buy any of the subsequent numbers and volumes ("NO" at step S64), a list of books in the same third  
20 category as the book of which data were recorded the latest is displayed on the display device 21 at step S66. Here, a list of books written by the same writer as the latest recorded book may be displayed. Then, if the user selects one from this list to buy at step S67, the title of the selected book is displayed at step S68, and the processes at step S49 and the  
25 subsequent steps are performed. If the user does not want to buy any of the books displayed at step S66 ("NO" at step S67), the program goes to

step S23 to display categorized book lists.

#### Another Way of Searching Books Related to Data in Storage Medium

Also, books related to the data stored in the storage medium may be searched and displayed under a procedure shown by Fig. 10. In this  
5 procedure, as Fig. 13m shows, books related to the data stored in the storage medium from various aspects are listed on the display device 21 at one stage, and the user selects/determines one from the list.

At step S71, revisions of the books of which data are in the storage medium are searched, and if it is judged at step S72 that there are  
10 revisions, a list of the revisions is displayed on the display device 21 at step S73. If there are no revisions, the subsequent numbers or volumes of the books are searched at step S74. If it is judged at step S75 that there are subsequent numbers or volumes, a list of these numbers and volumes is additionally displayed on the display device 21 at step S76.  
15 Further, books written by the same writers as the books are searched at step S77. If it is judged at step S78 that there are other books written by the writers, a list of the books is additionally displayed on the display device 21 at step S79. Furthermore, a list of books in the same third category as the book of which data were recorded the latest is additionally  
20 displayed at step S80.

When the user selects/determines a book to buy from the list at step S81, the processes at step S49 and the subsequent steps are performed. If the user does not find any desirable books in the list, the program goes to step S23, so that categorized book lists will be displayed.

25 An inquiry as shown by Fig. 13i may be displayed when data are read from the storage medium at step S31, so that the user can select a

way of searching books. Then, in accordance with the user's selection, a list of books is displayed.

### Key-word Search

Fig. 11 shows a subroutine for a key-word search performed at  
5 step S18. When the user selects a book search at step S17 (see Fig. 5),  
first at step S91, a picture for inputting a key word appears on the display  
device 21 (see Fig. 13j). When the user inputs the title of a book, the  
name of a writer and/or a publisher are inputted at step S92, the searched  
book(s) is/are listed at step S94. When the user selects/determines a  
10 book to buy at step S95, the title of the selected book is displayed at step  
S96.

Next at step S97, it is confirmed that a storage medium is inserted  
in the receiver 25, and the processes at step S41 and the subsequent  
processes are performed. If there are no storage media in the receiver 25,  
15 a message to instruct the user to insert a storage medium in the receiver  
25 is displayed at step S98, and the program waits until cancellation is  
requested at step S99 or until a storage medium is inserted.

On the other hand, if the user wants none of the books on the list  
("NO" at step S95), it is judged at step S100 whether the search is to be  
20 discontinued or to be continued. If the search is to be continued, the  
program goes back to step S91.

### Cancellation/Deletion

Fig. 12 shows a subroutine for data cancellation/deletion  
performed at step S15. This subroutine is executed when the user wants  
25 to return book data which the user has once purchased or when the user  
wants to delete book data because of short of memory or the like. When



the user selects data cancellation/deletion at step S14 (see Fig. 5), first at step S101, the content of data stored in the storage medium and the recording date and time are read out, and it is judged at step S102 whether or not there are any book data which have been purchased for  
5 the past specified hours. Book data are returnable only within a specified time from the recording time. If there are no such book data in the storage medium, an indication that cancellation is impossible is displayed at step S107, and the program goes to step S108.

If there are any returnable book data, a list of such books is  
10 displayed on the display device 21 at step S103. After the user selects book data to return at step S104, the selected book data are deleted from the storage medium at step S105. Then, the account is settled at step S106. At this time, a refund of the payment for the book data is made, and a communication fee and the like are deducted from the refund.

15 At and after step S108, a procedure to delete stored data is performed. When the user wants to delete data from the storage medium because the remaining capacity of the storage medium is small or any other reason, this procedure is executed. When the user's intention to delete data from the storage medium with no refunds is  
20 confirmed at step S108, a list of erasable book data is displayed on the display device 21 at step S109. When the user selects/determines book data to delete at step S110, the selected data are deleted from the storage medium at step S111. Then, the storage medium is ejected from the vending machine 2 at step S112.

25 In the procedure to delete data, although the text data of the selected book are deleted, the index information about the book such as

the title, the writer, the category, etc. may be left stored. If such information is left stored in the storage medium, it is possible to make an automatic book search using the information. This procedure of deleting data can be effectively adopted in libraries which do not charge the users  
5 in the premise that the users will return the book data. In this case, by deleting only the text data of a book and not deleting the index information, the user can use the index information later for an automatic book search, which will result in an efficient book search.

#### Display of Advertisement

10 When the user selects a book (at step S25, S34, S60, S65, S68 or S96), an advertisement of the book may be displayed to prompt the user to buy the book. For example, pictures shown by Figs. 13k and 13l are displayed alternately. A motion picture may be displayed, and it will be effective to display a motion picture like a preview of a movie.

#### 15 Other Embodiments

The electronic book vending machines and the electronic book players may be of any structure. The electronic book vending machines may be stored with popular book data, so that the vending machines may be imparted with a function of the data storage center. In the above  
20 embodiment, the vending machines are to sell book data for profit and cast accounts. However, such vending machines can be installed in libraries or any other public places as members of a system to distribute book data with no profit.

Although the present invention has been described in connection  
25 with the preferred embodiments above, it is to be noted that various changes and modifications are possible to those who are skilled in the art.

Such changes and modifications are to be understood as being within the scope of the present invention.

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